

**ABSTRACT OF THE DISCLOSURE**

A catalyst combustor (11) includes an inner catalyst combustion portion (20) connected to a substitute fuel supply line (LS21, 12, 16) and a substitute oxidizer supply line (LS22, 13), an outer catalyst combustion portion (40) connected to an effluent fuel  
5 supply line (LS23, 14) and an effluent oxidizer supply line (LS24, 15), and a fluid communication portion (60) connecting the inner catalyst combustion portion (20) and the outer catalyst combustion portion (40) to each other, and has a fixed relationship provided among a fluid resistance ( $R_2$ ) of the inner catalyst combustion portion (20), a  
10 fluid resistance ( $R_4$ ) of the outer catalyst combustion portion (40), and a fluid resistance ( $R_6$ ) of the fluid communication portion (60), whereby substantially a warming catalyst combustion is caused to occur simply in the inner catalyst combustion portion (20), and a regular catalyst combustion is caused to occur in the inner catalyst combustion portion (20) and the outer catalyst combustion portion (40).

Selected Fig. 2